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TITLE: A Randomized Controlled Trial to Decrease Suicidal Thinking in a Military Emergency Department

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CONTRACTING ORGANIZATION: The Geneva Foundation
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13. SUPPLEMENTARY NOTES

14. ABSTRACT
Ketamine is best known as an anesthetic agent used for induction or augmentation of general anesthesia. Additional uses of ketamine for mood augmentation have been considered and have shown promise, likely due to dopamine and serotonin reuptake and elevation of norepinephrine. A small study done by Larkin et al. (2010) at Yale University demonstrated benefit for short term resolution of suicidality after a single sub-anesthetic dose of 0.2 mg/kg rapid intravenous bolus with lasting remission out to 10 days. This project proposes to conduct a randomized, placebo-controlled trial of this, same intervention in military patients recently hospitalized for suicidal thinking. After being assessed, and giving informed consent, participants would receive 0.2mg/kg ketamine or placebo. Their suicidal thinking, depression, and other symptoms would be monitored acutely for 210 min after drug infusion, and for the lasting changes the next day, at hospital discharge, 2 weeks, and 1, 3, and 6 months. Potential adverse events will be monitored for up to 6 months.

15. SUBJECT TERMS
Suicide, ketamine, sub-anesthetic dose, rapid intervention bolus

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1. Introduction

For the past several years more soldiers have died by suicide than were killed in combat (AFHSC, 2012; AFHSC, 2012). Eighteen US veterans die each day by suicide (Kemp & Bossarte, 2013). Suicide is a significant problem for the military, not only resulting in unacceptable loss of life, but also negatively impacting moral and function on a wider scale. Service Members with suicidal thinking are currently caught in a difficult position, as treatment for the depression underlying suicidal thinking typically takes weeks to months to be effective. In the meantime, the only option may be psychiatric hospitalization, which although preferable to an imminent suicide, may create long term problems. By separating the individual from his or her support network, creating administrative military obstacles to returning to duty, instigating stigma, and, potentially estranging the hospitalized individual from longer term treatment. In spite of increasing access to treatment, suicide rates remain largely unchanged over the last few decades (Nock et al., 2008), highlighting the need for novel treatment approaches. Recently there is renewed interest in acute treatments that have anti-suicide effects such as ketamine (Larkin and Beautrais, 2011). Ketamine is best known as an anesthetic agent used for induction or augmentation of general anesthesia. It is classified pharmacologically as an NMDA receptor antagonist and has dissociative, sedative and analgesic properties at 1.0 – 4.5 mg/kg for induction. Additional uses of ketamine for mood augmentation have been considered and have shown promise, likely due to dopamine and serotonin reuptake and elevation or norepinephrine. A small study done by Larkin et al. (2010) at Yale University demonstrated benefit for short-term resolution of suicidality after a single sub-anesthetic dose of 0.2 mg/kg rapid intravenous bolus with lasting remission out to 10 days. This project proposes to conduct a randomized, placebo-controlled trial of this, same intervention in military patients recently hospitalized for suicidal thinking. After being assessed and giving informed consent, participants will receive a single sub-anesthetic rapid intravenous bolus dose of ketamine or saline (0.2 mg/kg). All subjects will be evaluated clinically with the Beck Suicidality Scale (BSS) at 15, 45, 90, 150 and 210 minutes after the start of ketamine or saline bolus. Subjects' dissociative experiences, if present post dose, will be evaluated by the Clinician Administered Dissociative States Scale (CADSS) at 15 and 45 minutes post dose and once again at 210 minutes post dose. For any lasting changes, subjects will be administered a BSS, Beck Depression Inventory (BDI), and Beck Hopelessness Scale (BHS) at next day post treatment, at the time of discharge, at 2 weeks post study dose and at 1, 3, and 6 months post study dose. Potential adverse events will be monitored for up to 6 months. If successful, the strategy of immediate treatment with ketamine could result in rapid relief of suicidality, minimize hospitalizations, improve return to duty rates, and lower the suicide rate in the military.

2. Keywords

Suicide, ketamine, sub-anesthetic dose, rapid intravenous bolus

3. Accomplishments

i. What were the major goals of the project?

The major goals of this project were as follows: 1) administrative setup to include hiring a Research Coordinator and purchasing psychometric scales, filing addendum to the IRB indicating that the study has been funded and update personnel list, and receiving HRPO approval; 2) conduct randomized placebo controlled trial to include recruiting and enrolling approximately 3.5 patients each month, completing treatment of 40 participants, and potentially requesting a modification to increase enrollment; and 3) perform analysis, disseminate results, and apply to do a longer, multi-site study to include working with statisticians from NMCSD's Clinical Investigation Department, publishing and presenting results, and working with other military medical centers to design a multi-site trial.

ii. What was accomplished under these goals?

The below table details what of each task was accomplished and provides a timeline for each accomplishment.

Task 1. Administrative Setup (Months 1-3) – Ceased
• 03/26/15: CRADA executed (NCRADA - NMCSD- 15-449) • 08/20/15: Revised protocol reviewed and approved by NMCSD IRB • 05/13/15 to 05/14/15: Dr. Capobianco went to IPR meeting at Fort Detrick • 05/14/15: Hired Research Coordinator • 06/01/15: Addendum submitted to NMCSD IRB to initiate PI change • 06/12/15: Study laptop and psychometric measures received • 06/24/15: Telephone conference with Geneva Grants and Contracts Administrator/ Specialist for study progress call • 06/25/15: PI change request submitted to CDMRP • 07/02/15: Ordered office supplies, printer, and scanner • 07/06/15:List of recommendations from panel members from the May 2015 Suicide Prevention IPR Meeting received • 08/11/15:Submitted amendment to NMCSD's IRB for protocol revisions per recommendation of panel members from the May 2015 Suicide Prevention IPR Meeting • 08/19/15: NMCSD IRB recommended revising study consent form • 08/19/15: Updated informed consent form per NMCSD IRB's recommendation • 08/19/15: Revised study protocol approved by NMCSD IRB • 09/14/15: IRB-approved documents sent to HRPO for secondary approval • 10/01/15: NCE request initiated • 01/22/2016: Received notification of deferral from HRPO review and oversight to the Department of Navy Human Research Protection Program, Bureau of Medicine and Surgery and HRPO • 01/25/2016: Received notification that Dr. Capobianco would take medical leave of absence. Determined Dr. Hurst would serve as acting PI in Dr. Capobianco's absence. • 02/10/2016: Received award modification approving No-Cost Extension, which extends the period of performance to 24 September 2017, and change of PI to Dr. Capobianco. • 03/14/2016: Submitted secondary level review package to the HRPP for secondary approval.

• 09/26/2016: Submitted IRB Closure to the NMCSD IRB.
Task 2. Conduct Randomized, Placebo Controlled Trial (Months 4-18) – Not Started
• Awaiting HRPP approval
Task 3. Perform Analysis. Disseminate Results, and (if appropriate) apply to do larger, multi-site study (Month19-24) – Not started
• None

iii. What opportunities for training and professional development has the project provided?
Nothing to report.

iv. How were the results disseminated to communities of interest?
Nothing to report.

v. What do you plan to do during the next reporting period to accomplish the goals?
Not applicable.

4. Impact

i. What was the impact on the development of the principal discipline(s) of the project?
Nothing to report.

ii. What was the impact on other disciplines?
Nothing to report.

iii. What was the impact on technology transfer?
Nothing to report.

iv. What was the impact on society beyond science and technology?
Nothing to report.

5. Changes/Problems

i. Changes in approach and reasons for change

The study experienced significant delays in obtaining regulatory approvals. A summary of relevant actions is provided below.

- 07/06/15: List of recommendations from panel members from the May 2015 Suicide Prevention IPR Meeting received.
- 08/11/15: Submitted amendment to NMCSD's IRB for protocol revisions per recommendation of panel members from the May 2015 Suicide Prevention IPR Meeting.

- 08/19/15: NMCSD IRB recommended revising study consent form. Updated informed consent form per NMCSD IRB's recommendation. Revised study protocol approved by NMCSD IRB.
- 09/14/15: IRB-approved documents sent to HRPO for secondary approval.
- 01/22/16: HRPO notified study team of deferral over review and oversight to HRPP.
- 03/14/16: IRB-approved documents sent to HRPP for secondary approval. Approval was never received.

Maria Vargas, Research Coordinator, ended her participation in the study 18 December 2015. Carol Anne Drastal, Research Nurse, provided administrative support to the study as needed in Ms. Vargas' absence.

The research team received a No-Cost Extension on 10 February 2016, which extended the period of performance to 24 September 2017 in light of regulatory delays and personnel changes, which had prevented study activities such as recruitment and enrollment.

Dr. Marc Capobianco left the U.S. Navy and ended his participation in the study. A replacement PI was not found, and it was decided that it would be best for all parties involved to cancel the study.

The below table details all changes specific to the study protocol.

Protocol Changes
Change: Specific objectives
Original (before editing): Determine whether a single sub-anesthetic rapid IV bolus dose of ketamine administered to acutely depressed patients with or without suicidality has a significant rapid antidepressant effect in the acutely depressed population. The study will pursue as a primary outcome measure whether a significant reduction in depressive symptoms, as assessed by the BSS, and BHS, occurs shortly after administration of ketamine at 40, 80, 120, and 240 minutes. A secondary outcome measure will be assessed to determine whether this single bolus of ketamine has a sustained reduction in suicidal thinking and other psychiatric symptoms. **Revisions (after editing):** Determine whether a single sub-anesthetic rapid IV bolus dose of ketamine administered to acutely suicidal patients has a significant rapid anti-suicidal effect. The study will pursue as a primary outcome measure whether a significant reduction in suicidal thinking, as assessed by the BSS, occurs shortly after administration of ketamine at 15, 45, 90, 150 and 210 minutes. A secondary outcome measure will be assessed to determine whether this single bolus of ketamine has a sustained reduction in suicidal thinking and other psychiatric symptoms. **Reason:** The study's main interest is to determine whether the administration of a single bolus dose of ketamine to acutely suicidal subjects will decrease suicidal thinking from shortly after infusion out to 6 months. This change was per the recommendation of panel members from the May 2015 Suicide Prevention IPR Meeting.

Change: Sample population
Original (before editing): Acutely depressed and/or suicidal **Revisions (after editing):** Acutely suicidal **Reason:** The study is primarily interested in effects on suicidal ideation regardless of underlying diagnosis
Change: Long-term follow-up
Original (before editing): 2 weeks and 10 weeks post dose **Revisions (after editing):** 2 weeks, and 1, 3, and 6 months post dose **Reason:** Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting. Current literature on the use of sub-anesthetic ketamine to decrease suicidal ideation does not include follow-up times longer than 4 months. To address the panel's recommendation, the gap in the literature, and to determine whether this single bolus of ketamine has a sustained reduction is suicidal thinking, subjects will be evaluated at 2 weeks, and 1, 3, and 6 months post study dose.
Change: Inclusion score for Beck Suicide Scale (BSS) revised
Original (before editing): BSS score greater than 4 **Revisions (after editing):** BSS score equal or greater than 10 **Reason:** Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Assessment timeframe shortly after study dose revised
Original (before editing): 40, 80, 120, and 240 minutes post dose **Revisions (after editing):** 15, 45, 90, 150 and 210 minutes post dose **Reason:** Prior studies typically start clinical assessments at 40 minutes post dose because ketamine (0.5mg/kg) is typically infused over 40 minutes (Zarate et al., 2006; Zarate et al., 2012). Meaning, clinical assessments are done right after infusion at 40, 80, 120, and 240 minutes. The current study will infuse 0.2mg/kg of ketamine over 1-2 minutes. To date, only one published study has infused 0.2mg/kg of ketamine over 1-2 minutes (Larkin & Beautrais, 2011); however this study started clinically assessing their subjects at 40 minutes. We propose to start clinical assessments as soon 15 minutes post study dose – right after drug infusion; we believe that there is information to be gathered before the 40-minute time point. Subsequent time points of 45, 90, 150 and 210 minutes are relatively close to the 40-80-120-240 standard timeline prior research have established. In addition to the longer follow-up periods of 1, 3, and 6 months, collecting responses before the 40-minute time point will make our study more unique, informative, and comprehensive as compared to prior studies. Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Changes: Timing of BSS, Beck Depression Inventory (BDI), and Beck Hopelessness Scale (BHS) revised
Original (before editing): Subjects evaluated with BSS, BHS, and BDI at 40, 80, 120, and 240 minutes, 24 hours post dose, at the time of discharge. All subjects reassessed with BSS, BDI, BHS, MADRS, and C-SSRS at 2 and 10 weeks. **Revisions (after editing):** Subjects evaluated with the BSS at 15, 45, 90, 150 and 210 minutes post dose. The BSS, BDI, and BHS will be used to assess subjects at 24 hours post dose, at the time of discharge, 2 weeks, and 1, 3, and 6 months follow-ups. **Reason:** Timing of measures is revised to reflect revised/additional time points and revised specific objectives.

Change: Montgomery–Asberg Depression Rating Scale (MADRS) and Columbia Suicide Severity Rating Scale (C-SSRS)
Original (before editing): Administered at 2 and 10 weeks. **Revisions (after editing):** Will not use. **Reason:** MADRS is highly correlated with the BDI; no reason to use both scales. Due to the addition of long-term follow-ups (i.e., 1, 3, and 6 months) we removed C-SSRS as a secondary measure to harmonize with other current ongoing studies as recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Clinician Administered Dissociative States Scale (CADSS)
Original (before editing): No such measure **Revisions (after editing):** CADSS as secondary measure administered at 15 and 45 minutes post dose and once again at 210 minutes post dose **Reason:** Ketamine has dissociative, sedative and analgesic properties at 1.0 – 4.5 mg/kg for induction. The current study, however, will use a sub-anesthetic dose 0.2 mg/kg. The CADSS will be used to measure subjects' dissociative experiences, if present at dose 0.2 mg/kg post dose. Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Contact information sheet
Original (before editing): None **Revisions (after editing):** Contact information sheet with subject's email, work/home addresses, phone numbers, and emergency contact will be collected upon enrollment to the study. **Reason:** Due to the additional/longer follow-up periods, subjects' contact information will be collected so the investigators can contact them for their follow-up assessments (BSS, BHS, BDI). If subject is unavailable for a face-to-face visit, the follow-up will be conducted via a telephone conversation.
Change: Assess subjects if they can guess whether or not they received the active drug or saline
Original (before editing): No such question **Revisions (after editing):** Subjects will be asked whether they thought they received ketamine or placebo: "what dose do you think you received today?" Subjects will respond to this question by choosing either one of the following response options: "Ketamine," "Water" or "I don't know." **Reason:** Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Timing of vital sign measurements revised
Original (before editing): Done every 5 minutes for 15 minutes. Then every 15 minutes for 1 hour after study drug was given. Then every 30 minutes X's 4, then every hour till subject is stable. **Revisions (after editing):** Vital sign measurements will be done every 5 minutes for 15 minutes. Then every 15 minutes for 1 hour after study drug was given. Then every 30 minutes time 1 hour, then every hour times 2 hours or until subject is stable. **Reason:** Monitor subjects' vital signs just as stated on the Ketamine SOP and per the Pharmacy and Therapeutics Committee's recommendation (see Appendices for ketamine SOP and Pharmacy and Therapeutics Committee's meeting minutes).
Change: Inclusion criteria
Original (before editing): Voluntarily hospitalized at NMCSD within 24 hours

Revisions (after editing): Voluntarily hospitalized at NMCSD within 72 hours **Reason:** To take in to account weekends, holidays and/or subjects' availabilities. Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Plus-or-minus-72-hour-window
Original (before editing): No 72-hour window **Revisions (after editing):** Beginning at 2 weeks post dose to 6 months post dose, a plus-or-minus-72-hour window will be included in each follow-up period. For example, individual data points for the 2-week follow-up period may contain data collected at exactly 2 weeks post dose, 2 weeks and 3 days post dose, and/or 1 week and 4 days post dose. **Reason:** To take in to account weekends, holidays and/or subjects' availabilities. Recommended by panel members from the May 2015 Suicide Prevention IPR Meeting.
Change: Planned statistical analysis
Original (before editing): For the results of each Beck questionnaire (BDI, BHS, BSS), a 2x5 repeated measures analysis of variance with interaction will be conducted (ketamine vs. placebo groups by five sequential scores on each patient), followed by post hoc pair-wise comparisons. Score on the BSS will be considered the primary outcome measure. **Revisions (after editing):** There are 11 sequential time points: baseline, 15, 45, 90, 150, and 210 minutes post dose, 24 hours post dose, 2 weeks, and 1, 3, and 6 months post dose. The analysis for the BSS (primary measure) will be broken up into 3 parts. Because the analysis will be broken up to in to 3 parts, in addition to the 11 sequential time points, max scores from prior timelines will be calculated and included in the analysis of subsequent timelines. The time points selected for each parts are as follows: (1) Immediate benefits: baseline, 15, 45, 90, 150, and 210 minutes post dose giving rise to a 2x6 ANOVA (ketamine vs. placebo by 6 time points). (2) Short-term benefits: baseline, immediate benefits max BSS score, 24 hours post dose and 2 weeks post dose giving rise to a 2x4 ANOVA (ketamine vs. placebo by 4 time points). (3) Long-term benefits: baseline, immediate and short-term benefits max BSS scores and 1, 3, and 6 months post dose giving rise to 2x6 ANOVA (ketamine vs. placebo by 6 time points). The analysis for the BDI and BHS will include 6 sequential time points: baseline, 24 hours post dose, 2 weeks, and 1, 3 and 6 months post dose giving rise to a 2x6 ANOVA (ketamine vs. placebo by 6 time points). The differences in BSS, BDI, and BHS scores between the ketamine and placebo groups from baseline to discharge date will be analyzed using an independent samples t-test. **Reason:** The analysis for the BSS (primary measure) will be broken up into 3 parts because an 11-time-point analysis would give just too many pair-wise combinations to be meaningful and push significance point too low. Because the analysis will be broken up to in to 3 parts, in addition to the 11 sequential time points, max scores from prior timelines will be calculated and included in the analysis of subsequent timelines.

ii. Actual or anticipated problems or delays and actions or plans to resolve them
Not applicable.

iii. Changes that had a significant impact on expenditures
Nothing to report.

iv. Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents
Nothing to report.

6. Products

i. Publications, conference papers, and presentations
Nothing to report.

ii. Website(s) or other Internet Site(s)
Nothing to report.

iii. Technologies or techniques
Nothing to report.

iv. Inventions, patent applications, and/or licenses
Nothing to report.

v. Other Products
Nothing to report.

7. Participants & Other Collaborating Organizations

i. What individuals have worked on the project?

Nathaniel Brown, MD – Associate Investigator. Dr. Nathaniel Brown will serve as an AI under supervision of Dr. Marc Capobianco and will assist with the oversight of the study implementation, data collection, statistical analysis, and publication of the data.

Marc Capobianco, MD – Principal Investigator (PI). Dr. Marc Capobianco will serve as the PI and will guide the team in all aspects of the research study to include actively recruiting and screening subjects for participation, review and obtain informed consent, randomize and perform experimental procedures and interim assessments. Dr. Capobianco will provide oversight in the study design and implementation. He will lead the preparation of progress reports, data analysis, interpretation of findings, and dissemination of results. As PI, Dr. Capobianco will facilitate communication with local leadership about the progress of the study. Dr. Capobianco has left the U.S. Navy and is no longer affiliated with the study.

Carol Anne Drastal, RN – Research Nurse. Ms. Carol Anne Drastal will assist the PI with performing statistical analyses, preparing reports and manuscripts, and presenting and disseminating research findings. Ms. Drastal will be responsible for administration of ketamine and physiological monitoring of subjects and recording and reporting any

adverse effects. Ms. Drastal will also provide administrative support as needed due to changes in personnel in the Research Coordinator position.

Donald, Hurst, MD (Acting PI). Dr. Hurst is temporarily acting as the study PI in Dr. Capobianco's absence and will guide the team in all aspects of the research study to include actively recruiting and screening subjects for participation, review and obtain informed consent, randomize and perform experimental procedures and interim assessments. Dr. Hurst will provide oversight in the study design and implementation. He will lead the preparation of progress reports, data analysis, interpretation of findings, and dissemination of results. As acting PI, Dr. Hurst continued to facilitate communication with local leadership about the progress of the study. Dr. Hurst made the initial determination that the study should be canceled, as he planned to act in this role only temporarily, and a replacement could not be found.

Warren Klam, MD – Medical Monitor. Dr. Warren Klam will serve as the Medical Monitor. Dr. Klam has served as medical monitor on dozens of research studies and will advocate purely for the safety and best interest of subjects.

Yuet-hing Lam, RPh – Pharmacist. Dr. Yuet-hing Lam will oversee accuracy of randomization, drug dispensing and drug accountability. She developed and implemented the NMCSD policy for ketamine infusion.

Robert McLay, MD – Consultant. Dr. Robert McLay will assist the PI with performing statistical analyses, preparing reports and manuscripts, and disseminating research findings.

Daniel Tarman, MD – Associate Investigator. Dr. Daniel Tarman will serve as an AI under supervision of Dr. Marc Capobianco and will assist with the oversight of the study implementation, data collection, statistical analysis, and publication of the data.

L. Giselle Valdivieso, MPH – Research Assistant. Ms. Valdivieso will assist in maintaining IRB and other regulatory documents.

Maria Vargas, MA – Research Coordinator. Ms. Vargas will oversee research design and methodology, according to the approved protocol. She will assist the PI with performing statistical analyses, preparing reports and manuscripts, and presenting and disseminating research findings. Ms. Vargas will be responsible for implementing day-to-day operations of the project including subject recruitment and scheduling, performing the informed consent process, tracking subjects, and facilitating subject follow-up. She will also assist with preparing all study related correspondence and ensure budget adherence. Ms. Vargas' participation in the study has ended, effective 18 December 2015.

Erik Voogd, MD – Associate Investigator (AI). Dr. Erik Voogd will serve as an AI under supervision of Dr. Marc Capobianco and will assist with the oversight of the study implementation, data collection, statistical analysis, and publication of the data.

ii. Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
Nothing to report.

iii. What other organizations were involved as partners?
Nothing to report.

8. Special Reporting Requirements

i. Collaborative Awards
Not applicable.

ii. Quad Chart
Attached.

9. Appendices
None.

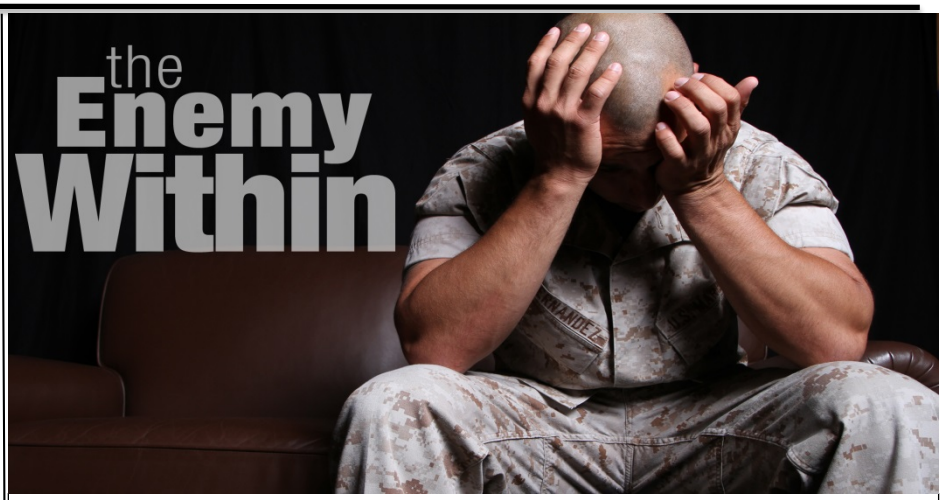
A Randomized Controlled Trial to Decrease Suicidal Thinking using Ketamine in a Military Population

Log Number 13137001 W81XWH-14-2-0181

PI: Dr. Marc Capobianco **Org:** The Geneva Foundation **Award Amount:** $213,223

The objective of this double-blinded placebo-controlled pilot study is:

- To determine whether a single sub-anesthetic rapid IV bolus dose of ketamine administered to active duty military patients presenting with acute suicidality requiring admission has a significant rapid antidepressant effect in this population.
- The primary outcome will be measured changes in suicidal thinking, as assessed by serial administration of the BSS at 15, 45, 90, 150, and 210 minutes following the bolus of ketamine.
- The secondary outcome measure will be to assess for sustained reduction in suicidal ideations and other psychiatric symptoms following a one-time bolus of ketamine.



The use of Ketamine could impact future treatment of the depressed/suicidal service member which could decrease length of stay for costly psychiatric admissions, while applying an effective treatment option potentially reducing mortality and morbidity.

Timeline and Cost

Activities CY	14	15	16	17
Administrative Set Up				
Conduct Trial				
Perform Analysis				
Disseminate Results				
Estimated Budget ($213K)	**$20K**	**$25K**	**$84K**	**$84K**

Updated: (11/21/16)

Goals/Milestones

CY14-16 Goal Administrative Setup - Ceased

a. Hire Research Coordinator, purchase psychometric scales
b. File addendum to IRB indicating that study has been funded and update personnel list.
c. Receive approval from CDMRP to start study with human subjects.

CY16-17 Goals Conduct Randomized, Placebo Controlled Trial – Not Started

a. Recruit and enroll approximately 3.5 patients every month to participate in trial
b. Complete treatment of 40 participants
c. If qualification rates are lower than expected (anticipate 80%), request modification to increase enrollment to reach a total of 40, treated participants.

CY17 Goals (cont.) Perform Analysis. Disseminate Results – Not Started

a. Statisticians from NMCSD's Clinical Investigation Department to review results.
b. Publish and present results (months 35-36)
c. If preliminary results are promising, work with other military medical centers to design multi-site trial. (Month 36).

Comments/Challenges/Issues/Concerns

Protocol revised from ER setting to Inpatient Psychiatric Unit.
Protocol for Ketamine Bolus needed to be reviewed by NMCSD Pharmacy P&T Committee to be approved for use on Psychiatric Inpatient Unit.

Budget Expenditure to Date

Projected Expenditure: $56,420.23
Actual Expenditure: $56,420.23